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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,438	04/10/2001	Zhen Liu	YOR920010031US1	3807

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EXAMINER

WOO, RICHARD SUKYOON

ART UNIT	PAPER NUMBER
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3639

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/832,438

Applicant(s)

LIU ET AL.

Examiner

Richard Woo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 101*

- 1) 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

- 2) Claims 1-14 and 29-42 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As an initial matter, the United States Constitution under Art. I, §8, cl. 8 gave Congress the power to "[p]romote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries". In carrying out this power, Congress authorized under 35 U.S.C. §101 a grant of a patent to "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition or matter, or any new and useful improvement thereof." Therefore, a fundamental premise is that a patent is a statutorily created vehicle for Congress to confer an exclusive right to the inventors for "inventions" that promote the progress of "science and the useful arts". The phrase "technological arts" has been created and used by the courts to offer another view of the term "useful arts". See *In re Musgrave*, 167 USPQ (BNA) 280 (CCPA 1970). Hence, the first test of whether an invention is eligible for a patent is to determine if the invention is within the "technological arts".

Further, despite the express language of §101, several judicially created exceptions have been established to exclude certain subject matter as being patentable subject matter covered by §101. These exceptions include "laws of nature", "natural

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phenomena", and "abstract ideas". See *Diamond v. Diehr*, 450, U.S. 175, 185, 209 USPQ (BNA) 1, 7 (1981). However, courts have found that even if an invention incorporates abstract ideas, such as mathematical algorithms, the invention may nevertheless be statutory subject matter if the invention as a whole produces a "useful, concrete and tangible result." See *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368, 1973, 47 USPQ2d (BNA) 1596 (Fed. Cir. 1998).

This "two prong" test was evident when the Court of Customs and Patent Appeals (CCPA) decided an appeal from the Board of Patent Appeals and Interferences (BPAI). See *In re Toma*, 197 USPQ (BNA) 852 (CCPA 1978). In *Toma*, the court held that the recited mathematical algorithm did not render the claim as a whole non-statutory using the Freeman-Walter-Abele test as applied to *Gottschalk v. Benson*, 409 U.S. 63, 175 USPQ (BNA) 673 (1972). Additionally, the court decided separately on the issue of the "technological arts". The court developed a "technological arts" analysis:

The "technological" or "useful" arts inquiry must focus on whether the claimed subject matter...is statutory, not on whether the product of the claimed subject matter...is statutory, not on whether the prior art which the claimed subject matter purports to replace...is statutory, and not on whether the claimed subject matter is presently perceived to be an improvement over the prior art, e.g., whether it "enhances" the operation of a machine. *In re Toma* at 857.

In *Toma*, the claimed invention was a computer program for translating a source human language (e.g., Russian) into a target human language (e.g., English). The court found that the claimed computer implemented process was within the "technological art"

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because the claimed invention was an operation being performed by a computer within a computer.

The decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* never addressed this prong of the test. In *State Street Bank & Trust Co.*, the court found that the "mathematical exception" using the Freeman-Walter-Abele test has little, if any, application to determining the presence of statutory subject matter but rather, statutory subject matter should be based on whether the operation produces a "useful, concrete and tangible result". See *State Street Bank & Trust Co.* at 1374. Furthermore, the court found that there was no "business method exception" since the court decisions that purported to create such exceptions were based on novelty or lack of enablement issues and not on statutory grounds. Therefore, the court held that "[w]hether the patent's claims are too broad to be patentable is not to be judged under §101, but rather under §§102, 103 and 112." See *State Street Bank & Trust Co.* at 1377. Both of these analysis goes towards whether the claimed invention is non-statutory because of the presence of an abstract idea. Indeed, *State Street* abolished the Freeman-Walter-Abele test used in *Toma*. However, *State Street* never addressed the second part of the analysis, i.e., the "technological arts" test established in *Toma* because the invention in *State Street* (i.e., a computerized system for determining the year-end income, expense, and capital gain or loss for the portfolio) was already determined to be within the technological arts under the *Toma* test. This dichotomy has been recently acknowledged by the Board of Patent Appeals and Interferences (BPAI) in affirming a

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§101 rejection finding the claimed invention to be non-statutory. See *Ex parte Bowman*, 61 USPQ2d (BNA) 1669 (BdPatApp&Int 2001).

In the instant application, there is no significant claim recitation of the data processing system or calculating computer to show the significant change in the data or for performing calculation operations in Claim 1.

In Claim 29, the computer program (or logic) itself can not be directed to a practical application of the invention in the useful art to accomplish a concrete, useful, and tangible result. When the computer program is actually executed by the computer, the claimed subject matter produces a useful, concrete and tangible result.

***Claim Rejections - 35 USC § 102***

3) Claims 1, 4-15, 18-29, and 32-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Smith (US 2002/0091854).

As for Claim 1, Smith discloses a method comprising:

calculating a total profit for processing requests received by the computing system for the data network site based on at least one service level agreement (see paragraphs [0013] –commission, [0014]-[0016]); and

allocating resources of the computing system to maximize the total profit (see Supra paragraph [0013] – allocate resources.).

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As for Claim 4, Smith further discloses the method, wherein the requests are classified into one or more classes of requests and each class of request has a corresponding service level agreement from the at least one service level agreement (see paragraphs [0063], [0066]).

As for Claim 5, Smith further discloses the method, wherein allocating resources includes determining an optimal traffic assignment for routing requests to thereby maximize the total profit (see Claim 1).

As for Claim 6, Smith further discloses the method, wherein the computing system is a web server farm and wherein the resources are servers of the web server farm (see paragraph [0034]).

As for Claim 7, Smith further discloses the method, further comprising determining an optimum resource allocation to maximize the total profit (see Supra Claim 1).

As for Claim 8, Smith further discloses the method, wherein determining an optimum resource allocation includes:

- modeling the resource allocation as a queuing network;

- decomposing the queuing network into separate queuing systems (see paragraph [0014] for three tier systems); and

- summing cost calculations for each of the separate queuing systems.

As for Claim 9, Smith further discloses the method, further comprising optimizing the summed cost calculations to maximize generated profit and thereby determine an optimum resource allocation (see Claim 1 and paragraphs [0013]-[0016]).

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As for Claim 10, Smith further discloses the method, wherein allocating resources includes determining an optimum traffic assignment and an optimum generalized processor sharing coefficient for a class of requests (see paragraph [0066]).

As for Claim 11, Smith further discloses the method, wherein allocating resources includes optimizing a cost function associated with a class of requests (see paragraph [0016]).

As for Claim 12, Smith further discloses the method, wherein optimizing the cost function includes modeling the optimization as a network flow from a source, through sinks representing sites/classes of request and servers/classes of requests, to a supersink (see Supra paragraphs).

As for Claim 13, Smith further discloses the method, wherein decomposing the queuing network into separate queuing systems includes decomposing the queuing network into decomposed models for each class in a hierarchical manner (see paragraphs [0063], [0066]).

As for Claim 14, Smith further discloses the method, wherein a decomposed model for class k is based on a decomposed model of classes 1 through k-1 (see Supra paragraphs).

As for Claim 15, Smith discloses an apparatus comprising:

means for calculating a total profit for processing requests received by the computing system for the data network site based on at least one service level agreement (see paragraphs [0013] –commission, [0014]-[0016]); and

means for allocating resources of the computing system to maximize the total profit (see Supra paragraph [0013] – allocate resources.).

As for Claim 18, Smith further discloses the apparatus, wherein the requests are classified into one or more classes of requests and each class of request has a corresponding service level agreement from the at least one service level agreement (see paragraphs [0063], [0066]).

As for Claim 19, Smith further discloses the apparatus, wherein allocating resources includes determining an optimal traffic assignment for routing requests to thereby maximize the total profit (see Claim 1).

As for Claim 20, Smith further discloses the apparatus, wherein the computing system is a web server farm and wherein the resources are servers of the web server farm (see paragraph [0034]).

As for Claim 21, Smith further discloses the apparatus, further comprising determining an optimum resource allocation to maximize the total profit (see Supra Claim 1).

As for Claim 22, Smith further discloses the apparatus, wherein determining an optimum resource allocation includes:

means for modeling the resource allocation as a queuing network;

means for decomposing the queuing network into separate queuing systems (see paragraph [0014] for three tier systems); and

means for summing cost calculations for each of the separate queuing systems.

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As for Claim 23, Smith further discloses the apparatus, further comprising optimizing the summed cost calculations to maximize generated profit and thereby determine an optimum resource allocation (see Claim 1 and paragraphs [0013]-[0016]).

As for Claim 24, Smith further discloses the apparatus, wherein allocating resources includes determining an optimum traffic assignment and an optimum generalized processor sharing coefficient for a class of requests (see paragraph [0066]).

As for Claim 25, Smith further discloses the apparatus, wherein allocating resources includes optimizing a cost function associated with a class of requests (see paragraph [0016]).

As for Claim 26, Smith further discloses the apparatus, wherein optimizing the cost function includes modeling the optimization as a network flow from a source, through sinks representing sites/classes of request and servers/classes of requests, to a supersink (see Supra paragraphs).

As for Claim 27, Smith further discloses the apparatus, wherein decomposing the queuing network into separate queuing systems includes decomposing the queuing network into decomposed models for each class in a hierarchical manner (see paragraphs [0063], [0066]).

As for Claim 28, Smith further discloses the apparatus, wherein a decomposed model for class  $k$  is based on a decomposed model of classes 1 through  $k-1$  (see Supra paragraphs).

As for Claim 29, Smith discloses a computer program product comprising:

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first instructions for calculating a total profit for processing requests received by the computing system for the data network site based on at least one service level agreement (see paragraphs [0013] –commission, [0014]-[0016]); and

second instructions for allocating resources of the computing system to maximize the total profit (see Supra paragraph [0013] – allocate resources.).

As for Claim 32, Smith further discloses the product, wherein the requests are classified into one or more classes of requests and each class of request has a corresponding service level agreement from the at least one service level agreement (see paragraphs [0063], [0066]).

As for Claim 33, Smith further discloses the product, wherein allocating resources includes determining an optimal traffic assignment for routing requests to thereby maximize the total profit (see Claim 1).

As for Claim 34, Smith further discloses the product, wherein the computing system is a web server farm and wherein the resources are servers of the web server farm (see paragraph [0034]).

As for Claim 35, Smith further discloses the product, further comprising determining an optimum resource allocation to maximize the total profit (see Supra Claim 1).

As for Claim 36, Smith further discloses the product, wherein determining an optimum resource allocation includes:

instruction for modeling the resource allocation as a queuing network;

instruction for decomposing the queuing network into separate queuing systems (see paragraph [0014] for three tier systems); and

instruction for summing cost calculations for each of the separate queuing systems.

As for Claim 37, Smith further discloses the product, further comprising optimizing the summed cost calculations to maximize generated profit and thereby determine an optimum resource allocation (see Claim 1 and paragraphs [0013]-[0016]).

As for Claim 38, Smith further discloses the product, wherein allocating resources includes determining an optimum traffic assignment and an optimum generalized processor sharing coefficient for a class of requests (see paragraph [0066]).

As for Claim 39, Smith further discloses the product, wherein allocating resources includes optimizing a cost function associated with a class of requests (see paragraph [0016]).

As for Claim 40, Smith further discloses the product, wherein optimizing the cost function includes modeling the optimization as a network flow from a source, through sinks representing sites/classes of request and servers/classes of requests, to a supersink (see Supra paragraphs).

As for Claim 41, Smith further discloses the product, wherein decomposing the queuing network into separate queuing systems includes decomposing the queuing network into decomposed models for each class in a hierarchical manner (see paragraphs [0063], [0066]).

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As for Claim 42, Smith further discloses the product, wherein a decomposed model or class k is based on a decomposed model of classes 1 through k-l (see Supra paragraphs).

***Claim Rejections - 35 USC § 103***

4) Claims 2-3, 16-17 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith.

Smith discloses the invention as recited above, but does not expressly disclose the invention including:

generating the profit when the allocation of resources is processed in accordance with SLA and generating the penalty otherwise.

Customer service is a key factor in the success of any business. The most common way to encourage the service sector to improve the customer service is by rewarding them when the service is satisfactory and giving the penalty for the poor service. This practice is well known in the business community and would follow in the Internet world as well.

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have added the well-known steps of rewarding the service provider for the satisfactory service and punishing them for the poor service for the purpose of providing an effective customer service.

***Conclusion***

5) The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,785,704 is cited to show a content distribution system for operation over an internet, including content peering arrangements.

US 6,842,783 is cited to show a method and system for controlling and guaranteeing a service level agreement based on a communications outbound link bandwidth usage to a plurality of customers having e-business hosted by at least one server as a server farm.

US 2002/0091636 is cited to show a system for collecting and aggregating data from network for a data consuming application. The system includes a data collector layer to receive network flow information from the network entities and to produce records based on the information.

US 2002/0062289 is cited to show a method for providing a variable communication quality network access for a user. The method allows a user to request a communication quality.

EP 1,458,134 is cited to show a network management procedure that applies measurements of traffic load to achieve greater efficiency in the operation of the network.

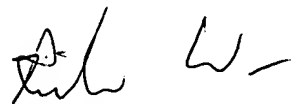
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Woo whose telephone number is 571-272-

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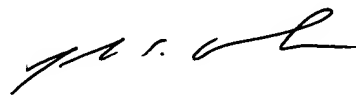
6813. The examiner can normally be reached on Monday-Friday from 8:30 AM -5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Weiss can be reached on 571-272-6812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard Woo  
Patent Examiner  
Art Unit 3629  
March 21, 2005



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